A Commercial Approach to JPEG 2000 Image Compression for the Mapping Community

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Mapping Science ...

- A Washington State Corporation
- Original MrSID™ team
- Strong GIS/Mapping background
- Solid relationships with major vendors
- Focus on mapping community
- Install base includes Army TEC, Space Imaging Corp., EarthSAT, USGS EDC and other fed, state, commercial users

Applied JPEG 2000

- Integration of J2K spatial compression with spectral compression of hyperspectral data
- Development of J2K encoding tools for robotic microscopy associated with biomed
- Development of J2K view .dll and encode routine for popular COTS GIS software
- Encryption/decryption routines for use with J2K-encoded data

Performance Enhancements

- Optimized parameters for handling large raster data sets in encode, decode, server and viewer routines
- Mosaic feature
- Specific support for Hyperspectral data
- Multiband, multiple resolution features
- Enhanced decode routines for extraction of selected components (window, scale, band.)

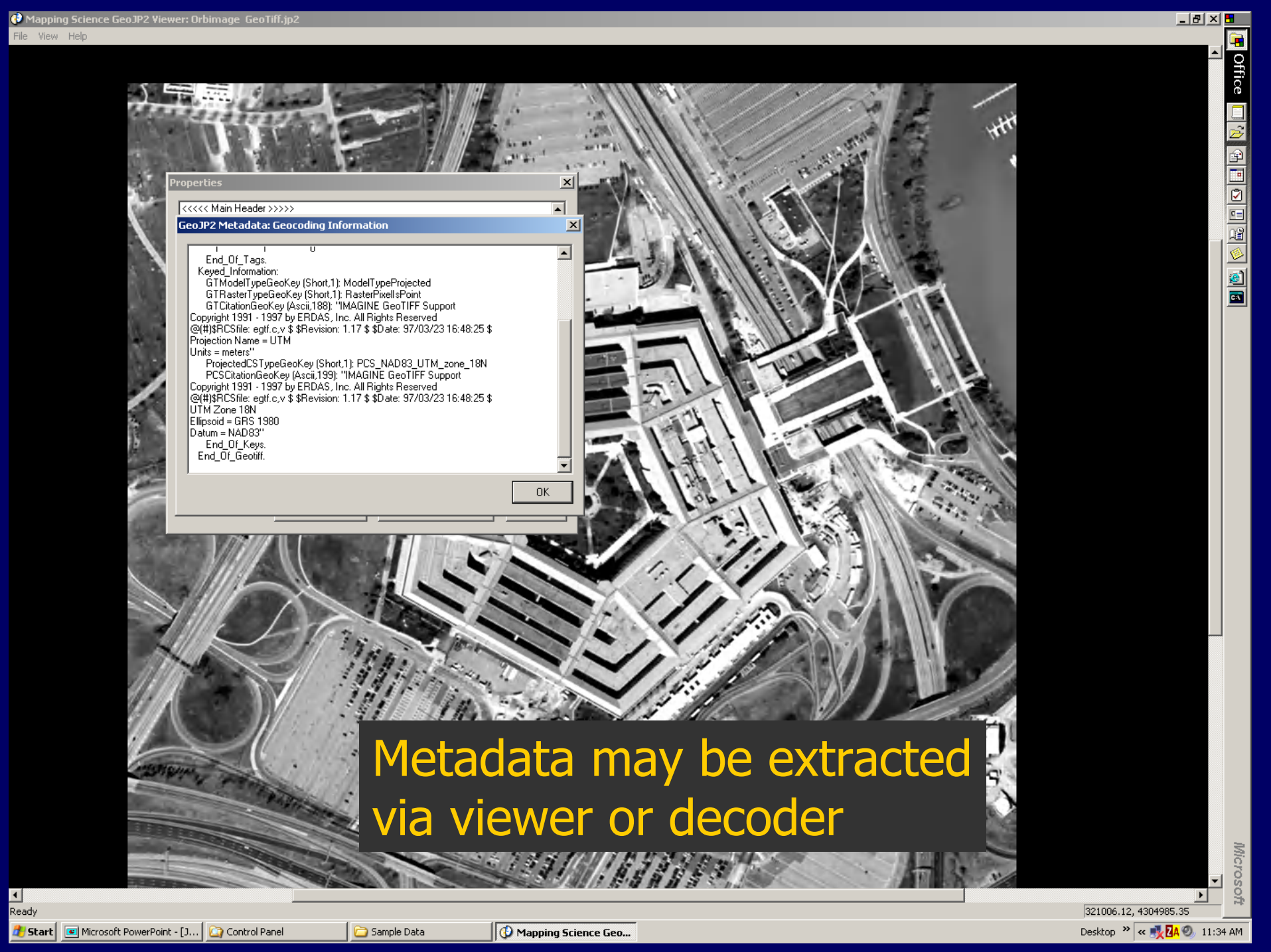
Georeferencing and metadata linked to JPEG 2000 data


```
ModelTiepointTag        = (  80,  100, 0,  200000,  1500000,  0)
    ModelPixelScaleTag       = (1000, 1000, 0)
    GeoKeyDirectoryTag:
        GTModelTypeGeoKey            =  1    (ModelTypeProjected)
        GTRasterTypeGeoKey           =  1    (RasterPixelIsArea)
        GeographicTypeGeoKey         =  4267  (GCS_NAD27)
        ProjectedCSTypeGeoKey        =  32767 (user-defined)
        ProjectionGeoKey             =  32767 (user-defined)
        ProjLinearUnitsGeoKey        =  9001    (Linear_Meter)
        ProjCoordTransGeoKey         =  8  (CT_LambertConfConic_2SP)
            ProjStdParallel1GeoKey   =  41.333
            ProjStdParallel2GeoKey   =  48.666
            ProjCenterLongGeoKey     = -120.0
            ProjNatOriginLatGeoKey   =  45.0
            ProjFalseEastingGeoKey,  = 200000.0
            ProjFalseNorthingGeoKey, = 1500000.0
              ETC
```

Use of boxes described in spec to include georeferencing with either GeoTIFF or TFW.

Integrated Georeferencing enables use in GIS applications

- Wavelet encoding tied to georeferencing
- Individually encoded imagery displays together in proper coordinate space with no gaps or spurious overlap.
- Does not preclude use of GML
- Approach is freely licensed to Application Developers (e.g., PCI & Leica)


Mapping Science GeoJP2 Viewer: Orbimage GeoTiff.jp2
File View Help
Properties
<<<<< Main Header >>>>>
GeoJP2 Metadata: Geocoding Information
End_Of_Tags.
Keyed_Information:
GTModelTypeGeoKey (Short,1): ModelTypeProjected
GTRasterTypeGeoKey (Short,1): RasterPixelIsPoint
GTCitationGeoKey (Ascii,188): "IMAGINE GeoTIFF Support
Copyright 1991 - 1997 by ERDAS, Inc. All Rights Reserved
@(#)$RCSfile: egtf.c,v $ $Revision: 1.17 $ $Date: 97/03/23 16:48:25 $
Projection Name = UTM
Units = meters"
ProjectedCSTypeGeoKey (Short,1): PCS_NAD83_UTM_zone_18N
PCSCitationGeoKey (Ascii,199): "IMAGINE GeoTIFF Support
Copyright 1991 - 1997 by ERDAS, Inc. All Rights Reserved
@(#)$RCSfile: egtf.c,v $ $Revision: 1.17 $ $Date: 97/03/23 16:48:25 $
UTM Zone 18N
Ellipsoid = GRS 1980
Datum = NAD83"
End_Of_Keys.
End_Of_Geotiff.
OK
Metadata may be extracted via viewer or decoder
Ready
321006.12, 4304985.35
Start
Microsoft PowerPoint - [J...
Control Panel
Sample Data
Mapping Science Geo...
Desktop
11:34 AM

MSI has added support for the following file formats:

- TIFF & TFW
  - GeoTIFF
- BIL/BIP/BSQ
  - IMG
- NITF 2.1
  - DRG
- DOQQ
  - JPG
- RAW
- ENVI
- PCI
- ECW

Export routines write to TIFF/TFW/JPEG

GeoJP2™ shipped Sept 2002

- Command Line encoder/decoder
- Supports GeoTIFF standard metadata
- Kakadu- based
- Batch processing
- Win95/98/2000/NT/XP
- No royalties or meters
- No file size limitations
- Free ESRI ArcView 3.x Extension
- Free StandAlone Viewer

Future Plans

- GUI version of encoder product
- Expanded metadata support
- Continued integration with partners
- Performance R&D
- Expanded OS support

Mapping Science, Inc.

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